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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,157	11/25/2003	T. Christian Boles	E0411.70005US03	8703

23628 7590 02/28/2007

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EXAMINER	
KAPUSHOC, STEPHEN THOMAS	
ART UNIT	PAPER NUMBER
1634	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/721,157	BOLES ET AL.	
	Examiner	Art Unit	
	Stephen Kapushoc	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *51-70* is/are pending in the application.

4a) Of the above claim(s) *51-60* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *51-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/9/04; 1/20/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-50 are cancelled.
Claims 51-70 are pending.
Claims 51-60 are withdrawn.
Claims 61-70 are examined on the merits.

Election/Restrictions

1. Applicant's election without traverse of the invention of Group II (claims 61-70), methods for analyzing a nucleic acid in a sample, in the reply filed on 12/11/2006 is acknowledged.

2. Claims 51-60 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 112 2nd¶ - Indefiniteness

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 61-70 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 61-70 are unclear over recitation of the phrase 'linking member/target complex' as recited in claims 61 and 64 because it is unclear what is encompassed by the '/'. It is not clear if the 'complex' requires, for example, both a linking member and a

target molecule, or either a linking member or a target molecule. It is suggested that the phrase be amended to define the invention as described in the specification.

Claim 62 is unclear over recitation of the phrase 'the contacting step occurs in solution', because claim 61 (from which claim 62 depends) is drawn to a method comprising two contacting steps. It is thus unclear which contacting step is 'the contacting step' further limited by claim 62.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 61, 63, 65, 68, and 69 are rejected under 35 U.S.C. 102(b) as being anticipated by Jiro et al (JP-H3 [1991]-47097 (A)), cited as reference B1 on page 4 of the IDS of 1/20/2004.

The page and line numbers cited in this rejection are those of the English language translation of this Japanese patent document as indicated on the translation provided with this Office Action.

Jiro et al teaches methods for the analysis of nucleic acids using oligonucleotide probes covalently attached to an acrylamide electrophoresis medium.

Regarding claim 61, the reference teaches contacting a sample with a linking member, where in the example of Jiro et al, a fragment 'of about 1,800 base pairs

contained in the vicinity of the 5' terminal of the beta-globin gene' (p.14 lns.8-14) is a linking member and the DNA probe (p.15 lns.8-18) is a sample. In the example of Jiro et al , the linking member has a first region (positions 14-32) that is complementary to a capture probe (p.13 lns.12-17), and a second region for binding to a region of the target molecule (p.15 lns.15-18). In the example of Jiro et al the first nucleic acid sequence (i.e. positions 14-32 of the linking member) is substantially absent from the sequence of the nucleic acid sample to be analyzed (p.15 ln.13). The reference teaches forming a complex by hybridization between the linking member and the target molecule (p.15 lns.20-21). The reference further teaches contacting the linking member with a capture probe (p.15 lns.18-19; p.14 lns.15-22), where the capture probe is covalently attached to the electrophoretic medium (p.13 ln.12 - p.14 ln.7).

Regarding claim 63, the reference teaches the detection of the nucleic acid in the sample (p.15 ln.24 - p.16 ln.18). The detection of the example of Jiro et al is a detection of the target molecule (p.15 ln.13) bound to the linking member.

Regarding claim 65, the reference teaches the analysis of nucleic acids (p.13 – Practical Examples).

Regarding claim 68, the reference teaches that the linking member comprises a detectable moiety, where positions 53-72 of the linking member are a moiety detectable with a labeled nucleic acid (p.15 lns.8-18).

Regarding claim 69, the reference teaches that the target nucleic acid is labeled with esterase, which is a detectable moiety (p.15, ln.15).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 62, 64, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiro et al (JP-H3 [1991]-47097 (A)), cited as reference B1 on page 4 of the IDS of 1/20/2004 in view of Stabinsky (1988) (US Patent 4,751,177).

The page and line numbers cited in this rejection in reference to Jiro et al are those of the English language translation of this Japanese patent document as indicated on the translation provided with this Office Action.

Jiro et al teaches methods for the analysis of nucleic acids using oligonucleotide probes covalently attached to an acrylamide electrophoresis medium. The reference teaches contacting a sample with a linking member, where in the example of Jiro et al, a fragment 'of about 1,800 base pairs contained in the vicinity of the 5' terminal of the beta-globin gene' (p.14 lns.8-14) is a linking member and the DNA probe (p.15 lns.8-18) is a sample. In the example of Jiro et al , the linking member has a first region (positions 14-32) that is complementary to a capture probe (p.13 lns.12-17), and a second region for binding to a region of the target molecule (p.15 lns.15-18). In the example of Jiro et al the first nucleic acid sequence (i.e. positions 14-32 of the linking member) is substantially absent from the sequence of the nucleic acid sample to be analyzed (p.15 ln.13). The reference teaches forming a complex by hybridization

between the linking member and the target molecule (p.15 lns.20-21). The reference further teaches contacting the linking member with a capture probe (p.15 lns.18-19; p.14 lns.15-22), where the capture probe is covalently attached to the electrophoretic medium (p.13 ln.12 - p.14 ln.7).

Thus Jiro et al teaches a method with all the limitations of claim 61, from which claims 62 and 64 depend.

Jiro et al does not teach a method in which a step for contacting different nucleic acids occurs in solution (claim 62), or a method comprising electrophoretically migrating a complex comprising a linking member and a target molecule through an electrophoretic medium.

Stabinsky teaches methods for the analysis nucleic acids using an immobilized oligonucleotide probe attached to a solid support, a mediator probe which hybridizes to a target nucleic acid and the immobilized oligonucleotide probe attached to a solid support, and the a labeled detector probe (col.3 lns.35-53).

Regarding claim 62, Stabinsky teaches performing a sandwich-type oligonucleotide hybridization assay by first contacting a linker (termed a 'mediator' by Stabinsky) with a target in solution (e.g. col.14 Example 3), followed by hybridization to a capture probe immobilized on a solid support.

Regarding claim 70, the reference teaches that the target molecule, associated with the solid support through an interaction with the mediator probe (where the mediator probe is hybridized to the immobilized capture probe), is further hybridized to a labeled detector probe.

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have performed the target:linking member hybridization methods of Stabinsky to provide a complex for analysis via the methods of Jiro et al, including the capture of a target:linking member complex by a capture probe attached to an electrophoretic medium. Regarding claim 64, combining the methods of Stabinsky (where a target and linking member are contacted in solution prior to capture by an immobilized probe) with the method of Jiro et al (where a target:linking member complex is captured by a probe immobilized by covalent attachment to an electrophoretic medium), would result in a method in which the target:linking member complex is electrophoretically migrated through the electrophoretic medium in order to contact the complex with the immobilized capture probe. One would have been motivated to combine the methods of Stabinsky with the methods of Jiro et al based on the teachings of Stabinsky that such methods provide accurate detection of target molecules while minimizing the effect of probe leakage (col.3 lns.29-32; Table IV; col.15 lns.15-20), as well as the assertion of Jiro et al that hybridization in an electrophoretic medium offers a fast hybridization reaction rate (p.7 lns.22-25).

9. Claims 66 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiro et al (JP-H3 [1991]-47097 (A)), cited as reference B1 on page 4 of the IDS of 1/20/2004 in view of Shibata et al (1996).

The teachings of Jiro et al are applied to claims 66 and 67 as they were previously applied to claims 62, 64, and 70.

Jiro et al does not teach a method in which the sample comprises SRP RNA, or 4.5S RNA.

Shibata et al teaches the analysis 4.5S RNA binding proteins in *E. coli* (p.13162, right col., last ¶), including analysis of 4.5S RNA in samples via northern analysis (p.13163, right col. – Detection of 4.5S RNA associated with EF-G in vivo; Fig 9).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have analyzed the sample comprising 4.5S RNA taught by Shibata et al using the sample analysis methods of Jiro et al. One would have been motivated to use the methods of Jiro et al based on the assertion of Jiro et al that hybridization in an electrophoretic medium offers a fast hybridization reaction rate (p.7 lns.22-25).

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 61, 63, 65, 68, and 69 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 18-26 of copending Application No. 11/252,196 (publication number US 2006/0088867 A1) in view of Jiro et al (JP-H3 [1991]-47097 (A)), cited as reference B1 on page 4 of the IDS of 1/20/2004.

The claims of the conflicting application are drawn to a method for purifying a nucleic acid comprising the steps of: (a) introducing a sample containing a nucleic acid in a unit comprising an electrophoretic medium comprising at least one immobilized capture probe; and (b) subjecting the medium to a an electrophoretic field resulting in the migration of the test sample through the medium under conditions suitable to form a hybrid between the target molecule and the capture molecule.

The claims of the conflicting application do not specify a covalent attachment between the capture probe and the electrophoretic medium, or contacting the sample with a third nucleic acid where the target has a region of complementarity to the third nucleic acid that is absent from the capture probe (relevant to claim 61). Further the claimed methods of the conflicting application do not require detecting the nucleic acids (claim 63), or nucleic acids comprising detectable moieties (claims 68 and 69).

However, such modifications of the claimed method were know in the art at the time the instant invention was made.

Jiro et al teaches methods for the analysis of nucleic acids using oligonucleotide probes covalently attached to an acrylamide electrophoresis medium.

Jiro et al reference teaches contacting a sample with a linking member, where in the example of Jiro et al, a fragment 'of about 1,800 base pairs contained in the vicinity of the 5' terminal of the beta-globin gene' (p.14 lns.8-14) is a linking member and the DNA probe (p.15 lns.8-18) is a sample. The reference teaches forming a complex by hybridization between the linking member and the target molecule (p.15 lns.20-21). The reference further teaches contacting the linking member with a capture probe (p.15 lns.18-19; p.14 lns.15-22), where the capture probe is covalently attached to the electrophoretic medium (p.13 ln.12 - p.14 ln.7).

Relevant to claim 63, the reference teaches the detection of the nucleic acid in the sample (p.15 ln.24 - p.16 ln.18). The detection of the example of Jiro et al is a detection of the target molecule (p.15 ln.13) bound to the linking member.

Regarding claim 68, the reference teaches that the linking member comprises a detectable moiety, where positions 53-72 of the linking member are a moiety detectable with a labeled nucleic acid (p.15 lns.8-18).

Regarding claim 69, the reference teaches that the target nucleic acid is labeled with esterase, which is a detectable moiety (p.15, ln.15).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have modified the method claimed in the conflicting application with the methods taught by Jiro et al to have arrived at the method of the instant application. One would have been motivated to use the methods of Jiro et al

based on the assertion of Jiro et al that hybridization in an electrophoretic medium offers a fast hybridization reaction rate (p.7 lns.22-25).

This is a provisional obviousness-type double patenting rejection.

Conclusion

12. No claim is allowable. No claim is free of the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Kapushoc whose telephone number is 571-272-3312. The examiner can normally be reached on Monday through Friday, from 8am until 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached at 571-272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stephen Kapushoc
Art Unit 1634

BJ FORMAN, PH.D.
PRIMARY EXAMINER